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INVESTOR IN PEOPLE

17 FEB 2005

## PRIORITY DOCUMENT

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The Patent Office

Concept House

Cardiff Road

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South Wales

NP10 8QC'D 28 JUL 2003

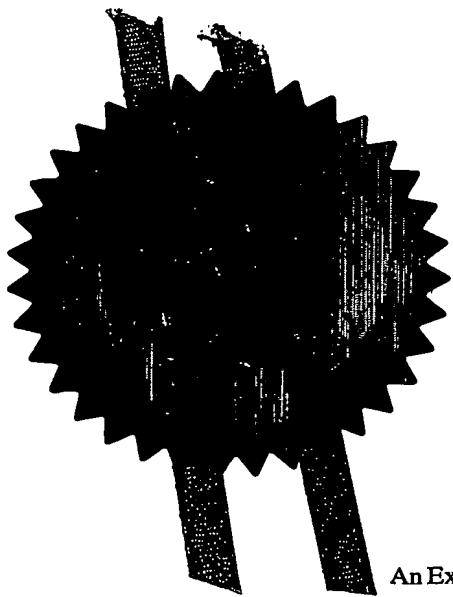
WIPO PCT

I, the undersigned, being an officer duly authorised in accordance with Section 74(1) and (4) of the Deregulation & Contracting Out Act 1994, to sign and issue certificates on behalf of the Comptroller-General, hereby certify that annexed hereto is a true copy of the documents as originally filed in connection with the patent application identified therein.

In accordance with the Patents (Companies Re-registration) Rules 1982, if a company named in this certificate and any accompanying documents has re-registered under the Companies Act 1980 with the same name as that with which it was registered immediately before re-registration save for the substitution as, or inclusion as, the last part of the name of the words "public limited company" or their equivalents in Welsh, references to the name of the company in this certificate and any accompanying documents shall be treated as references to the name with which it is so re-registered.

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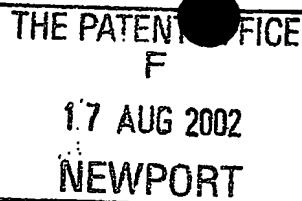
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Signed

Dated

15 July 2003



The  
Patent  
Office

1/77

17 AUG 2002 E741880-1 D00393

P01/7700 0.00-0219211.0

The Patent Office

**Request for grant of a patent**

(See the notes on the back of this form. You can also get an explanatory leaflet from the Patent Office to help you fill in this form)

Cardiff Road  
Newport  
Gwent NP10 8QQ

**1. Your reference**

2002P12988 GB / P72 / CF / GD

**2. Patent application number**  
(The Patent Office will fill in this part)

0219211.0

17 AUG 2002

**3. Full name, address and postcode of the or of each applicant** (underline all surnames)

OXFORD MAGNET TECHNOLOGY LTD.  
WHARF ROAD, EYNSHAM  
OXFORD OX8 1BP

Patents ADP number (if you know it)

6477760002

If the applicant is a corporate body, give the country/state of its incorporation

UNITED KINGDOM

**4. Title of the invention**

MODIFICATION IN COPRESSOR CIRCUIT TO PREVENT OIL CARRY OVER TO THE PTR COLD HEAD

**5. Name of your agent (if you have one)**

"Address for service" in the United Kingdom to which all correspondence should be sent (including the postcode)

Siemens Shared Services Limited  
Intellectual Property Department  
The Lodge, Roke Manor  
Romsey  
Hampshire SO51 0ZN

Patents ADP number (if you know it)

08439358001

**6. If you are declaring priority from one or more earlier patent applications, give the country and the date of filling of the or of each these earlier applications and (if you know it) the or each application number**

Country Priority application number  
(if you know it)

Date of filing  
(day / month / year)

**7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filling date of the earlier application**

**8. Is a statement of inventorship and of right to grant of a patent required in support of this request? (Answer 'Yes' if:**

Yes

a) any application named in part 3 is not an inventor, or  
b) there is an inventor who is not named as an applicant, or  
c) any named applicant is a corporate body.  
See note (d))

9. Enter the number of sheets for any of the following items you are filling with this form.  
Do not count copies of the same document

Continuation sheets of this form

Description	2
Claim(s)	0
Abstract	0
Drawing(s)	0

6

10. If you are also filing any of the following, state how many against each item.

Priority documents

Translation of priority documents

Statement of inventorship and right to grant a patent (Patents Form 7/77)

1

Request for preliminary examination and search (Patents Form 9/77)

Request for substantive examination (Patents Form 10/77)

Any other documents  
(please specify)

11.

I/We request the grant of a patent on the basis of this application

Signature

Clive French

Intellectual Property Department

Date

16.08.2002

12. Name and daytime telephone number of Person to contact in the United Kingdom

Clive French

01794 833573

Warning

After an application for a patent has been filed, the Comptroller of the Patent Office will consider whether publication or communication of the invention should be prohibited or restricted under Section 22 of the Patents Act 1977. You will be informed if it is necessary to prohibit or restrict your invention in this way. Furthermore, if you live in the United Kingdom, Section 23 of the Patents Act 1977 stops you from applying for a patent abroad without first getting Written permission from the Patent Office unless an application has been filed at least 6 weeks beforehand in the United Kingdom for a patent for the same invention and either no direction prohibiting publication or

Communication has been given, or any such direction has been revoked.

**Notes**

- a) If you need help to fill in this form or you have any questions, please contact the Patent Office on 0645 500505
- b) Write your answers in capital letters using black ink or you may type them
- c) If there is not enough space for all the relevant details on any part of this form, please continue on a separate sheet of paper and write "see continuation sheet" in the relevant part(s). any continuation sheet should be attached on this form.
- d) If you have answered 'Yes' Patents Form 7/77 will need to be filed.
- e) Once you have filled in the form you must remember to sign and date it.
- f) For details of the fee and ways to pay please contact the Patent Office.

## **Modification in Compressor Circuit to prevent Oil carry over to the Pulse Tube refrigerator ( PTR ) Cold head**

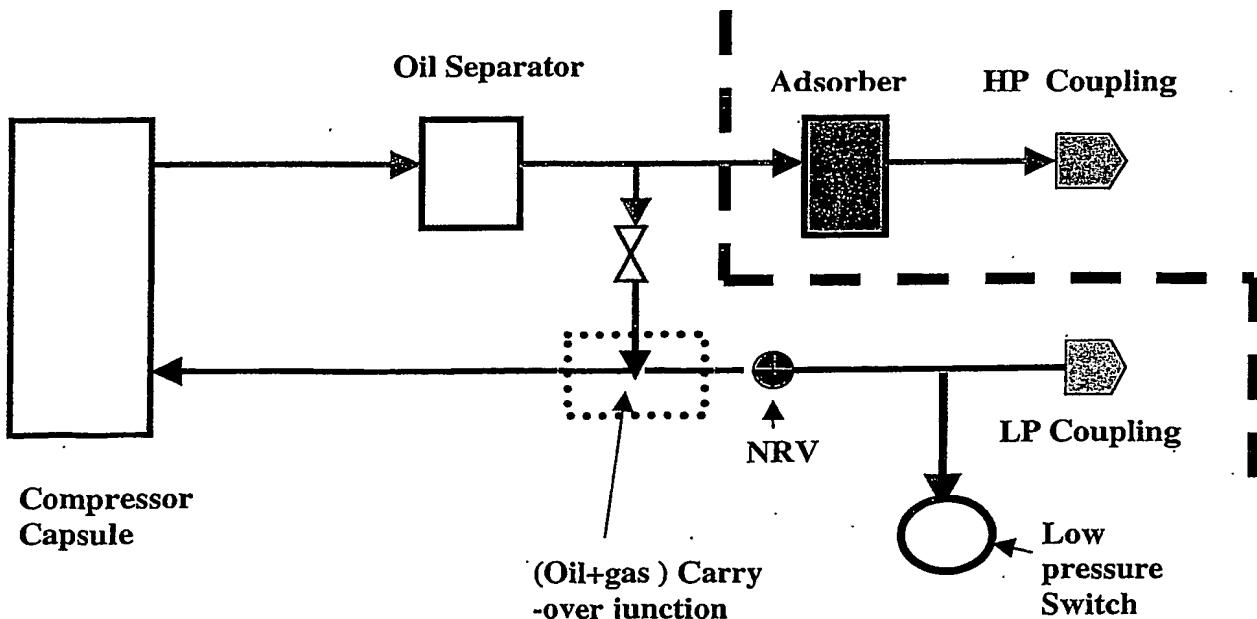
**Authors : Milind Atrey, D. Crowley**

### **Oil Carry over in the PTR**

It is observed that oil migrates from the compressor to the PTR cold head through the Low pressure (LP) flex line. The reason for this is a high pressure difference developed due to stoppage of the PTR's rotary valve when the compressor is dynamic. When the rotary valve stops, the compressor pressure increases to a very high value, 28-29 bar approximately, and the low pressure flex line experiences a sudden fall in the pressure down to 1.5- 2 bar approximately. As a result, a part of the ( oil+ gas ) mixture is bypassed internally without going to the adsorber and also travels across the non return valve (NRV) due to high pressure difference. If this action continues over a period of time, the LP flex line becomes flooded with oil and then the PTR cold head and the high pressure flex line also. The PTR in this condition can not function satisfactorily and one may have to discard the whole system due to severe contamination.

### **Modification in compressor circuit to overcome Oil-migration**

A low pressure switch would be connected in the LP line after the NRV. As soon as the switch senses the low pressure, e.g. of 4-5 bar, due to rotary valve stoppage, it will stop the compressor. This does not exist in the present circuits of any compressor.



### **Advantages of this Modification**

The use of this switch will avoid having to use an adsorber or gas reservoir in the low pressure line which is being currently followed. Use of adsorber just manages the problem but does not prevent it. Also, it makes the whole system bulkier and more costly. The above modification will however prevent the occurrence of oil carry over from the compressor.